

# **SIGNAL LINE CONNECTOR**

## **BACKGROUND OF THE INVENTION**

### **1. Field of the Invention:**

The present invention relates to connectors and, more specifically, to a signal line connector, which comprises a hollow cylindrical casing fastened to a locknut to hold a center holding down tube on the inside, a gasket ring mounted in between the hollow cylindrical casing and the locknut to seal the gap, and a locating barrel fitted into the hollow cylindrical casing and adapted to hold down the tubular outer conductor and outer insulative layer of a signal line outside the center holding down tube, for enabling the center conductor to be axially suspended in the locknut..

### **2. Description of the Related Art:**

A conventional signal line connector is known comprising a connector body affixed to a thin tube for accommodating a signal line. After insertion of a signal line into the connector body and the thin tube a crimping device is used to crimp and distort the thin tube, causing the thin tube to be fixedly secured to the signal line. When crimping the thin tube, the thin tube may break along its seam line. Therefore, a contact error may occur, or the signal line may be separated from the signal line connector when the signal line stretched. There is also known a coaxial cable connector in which a socket is rotatably coupled to a hollow cylindrical casing

and defines with the casing an annular space, and a locating member having an axially extended tapered hole is sleeved onto the rear extension of the barrel for squeezing the socket to hold down a coaxial cable. The installation procedure of this design is  
5 complicated. If the coaxial cable is curved or stretched during installation, the locating member tends to be vibrated and loosened, resulting in a contact error or disconnection of the coaxial cable.

Therefore, it is desirable to provide a signal line connector that eliminates the aforesaid drawbacks.

## **10 SUMMARY OF THE INVENTION**

The present invention has been accomplished under the circumstances in view. It is the main object of the present invention to provide a signal line connector, which holds down the signal line tightly when installed. It is another object of the present invention  
15 to provide a signal line connector, which effectively protects permeation of moisture. It is still another object of the present invention to provide a signal line connector, which is easy to install.

According to one aspect of the present invention, the signal  
20 line connector comprises a locknut, a hollow cylindrical casing, the hollow cylindrical casing having a coupling neck and fitted into the locknut, a locating barrel fitted into the other end of the hollow cylindrical casing, the locating barrel having an inside annular

flange, and a center holding down tube mounted in the hollow cylindrical casing and secured to the locknut by the hollow cylindrical casing, the center holding down tube having a barbed portion facing the inside annular flange of the locating barrel and  
5 adapted to hold down the tubular outer conductor and outer insulative layer of a signal line against the inside wall of the locating barrel, keeping the center conductor of the signal line axially suspended in the locknut. According to another aspect of the present invention, a gasket ring is mounted in an outside  
10 annular groove around the periphery of the coupling neck of the hollow cylindrical casing and stopped against the inside wall of the locknut to seal the gap. According to still another aspect of the present invention, the hollow cylindrical casing has an inside annular groove in one end for the positioning of the locating barrel.  
15 According to still another aspect of the present invention, the locating barrel has outside annular flanges selectively engaged into the inside annular groove of the hollow cylindrical casing subject to the presence of the signal line, keeping the locating barrel secured to the hollow cylindrical casing.

## **20 BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1 is an elevational view of a signal line connector according to the present invention.

FIG. 2 is an exploded view of the signal line connector

according to the present invention.

FIG. 3 is a sectional exploded view showing the relationship between the signal line connector and the signal line according to the present invention.

5           FIG. 4 is a sectional assembly view showing the signal line fastened to the signal line connector according to the present invention.

FIG. 4A is an enlarged view of a part of FIG. 4.

FIG. 5 is a sectional exploded view showing the  
10           relationship between the signal line connector and the adapter before installation of the signal line in the signal line connector according to the present invention.

FIG. 6 is a sectional exploded view showing the relationship between the signal line connector and the adapter after  
15           installation of the signal line in the signal line connector according to the present invention.

#### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

Referring to FIGS. 1~3, a signal line connector 1 in accordance with the present invention is shown comprised of a  
20           locknut 2, a center holding down tube 3, a hollow cylindrical casing 4, and a locating barrel 5.

The locknut 2 has an inner thread 21 in one end, namely, the rear end, and a coupling portion 22 in the other end, namely, the

front end.

The center holding down tube **3** is coupled to the coupling portion **22** of the locknut **2**, having a tube body **32**, a barbed portion **321** at the front end of the tube body **32**, a coupling portion **31** at the rear end of the tube body **32**, and a passage hole **33** axially extended through the coupling portion **31**, the tube body **32** and the barbed portion **321**.

The hollow cylindrical casing **4** is mounted on the center holding down tube **3**, having a coupling neck **41** axially extended from the rear end, an outside annular groove **411** around the periphery of the coupling neck **41**, a rear coupling hole **42** and a front coupling hole **43** axially aligned in a line and respectively extended through the rear and front ends, and an inside annular groove **431** extended around the inside wall in the front coupling hole **43**.

The locating barrel **5** is plugged into the front coupling hole **43** of the hollow cylindrical casing **4**, having a receiving hole **51** axially extended through the front and rear ends, an inside annular flange **511** extended around the inside wall in the receiving hole **51**, a first outside annular flange **521** around the rear end of the periphery **52**, and a second outside annular flange **522** around a middle part of the periphery **52**.

During the assembly process, a gasket ring **412** is mounted

in the outside annular groove 411 of the hollow cylindrical casing 4, and then the center holding down tube 3 is plugged into the rear end of the hollow cylindrical casing 4 to engage the coupling portion 31 in the rear coupling hole 42 of the coupling neck 41, and then the center holding down tube 3 is fastened with the coupling neck 41 of the hollow cylindrical casing 4 to the coupling portion 22 of the locknut 2, and then the locating barrel 5 is plugged into the front coupling hole 43 of the hollow cylindrical casing 4 to engage the first outside annular flange 521 of the locating barrel 5 into the inside annular groove 431 of the hollow cylindrical casing 4.

Referring to FIG. 4 and FIG. 3 again, when connecting the signal line connector 1 to a signal line 6, the signal line 6 is inserted through the receiving hole 51 of the locating barrel 5 to force the inner insulative layer 62 and the center conductor 61 into the passage hole 33 of the center holding down tube 3, causing the tubular outer conductor 63 and outer insulative layer 64 of the signal line 6 to be jammed in between the barbed portion 321 of the center holding down tube 3 and the inside wall of the hollow cylindrical casing 4, and then the locating barrel 5 is pushed inwards toward the inside of the inner end of the front coupling hole 43 to disengage the first outside annular flange 521 of the locating barrel 5 from the inside annular groove 431 of the hollow

cylindrical casing 4 and to engage the second outside annular flange 522 of the locating barrel 5 into the inside annular groove 431 of the casing 4. When installed, the periphery 52 of the locating barrel 5 is radially inwardly forced by the periphery of the front coupling hole 43 of the hollow cylindrical casing 4 against the signal line 6 and the center holding down tube 3, thereby causing the barbed portion 321 of the center holding down tube 3 and the inside annular flange 511 of the locating barrel 5 to hold down the tubular outer conductor 63 and outer insulative layer 64 of the signal line 6 positively, and therefore the signal line 6 will not easily be pulled away from the signal line connector 1.

Referring to FIG. 4 and FIG. 4A again, when inserting the locating barrel 5 into the inside of the hollow cylindrical casing 4, the periphery 52 of the locating barrel 5 is squeezed to deform by the periphery of the front coupling hole 43 of the casing 4, and the inside annular flange 511 of the locating barrel 5 is aimed at a flat face 3211 of the barbed portion 321 of the center holding down tube 3, thereby causing the inside annular flange 511 of the locating barrel 5, the barbed portion 321 and the flat face 3211 of the center holding down tube 3 to hold down the signal line 6. Therefore, when stretching the signal line 6, the locating barrel 5 will not be pulled away from the hollow cylindrical casing 4, and the signal line 6 will be maintained connected to the signal line connector 1.

Referring to FIGS. 5 and 6, after the connection of the signal line connector 1 and the signal line 6, the signal line connector 1 can then be connected to a adapter 7. When connecting the signal line connector 1 to the adapter 7, thread the inner thread 5 21 of the locknut 2 onto the outer thread 71 of the adapter 7, keeping the center conductor 61 of the signal line 6 axially suspended in the adapter 7 for signal transmission.

As indicated above, the present invention provides a signal line connector, in which the hollow cylindrical casing has one end 10 mounted with a center holding down tube and then coupled to a locknut, and the other end mounted with a locating barrel. The center holding down tube and the locating barrel secure the signal line to the hollow cylindrical casing positively. Further, when the hollow cylindrical casing and the locknut fastened up, the gasket 15 ring seals the gap between the hollow cylindrical casing and the locknut against moisture.

A prototype of signal line connector has been constructed with the features of FIGS. 1~6. The signal line connector functions smoothly to provide all of the features discussed earlier.

20 Although a particular embodiment of the invention has been described in detail for purposes of illustration, various modifications and enhancements may be made without departing from the spirit and scope of the invention. Accordingly, the

invention is not to be limited except as by the appended claims.